

**Umm Al-Qura University**

**College of Engineering and Islamic Architecture**

**Electrical Engineering Department**

**Engineering Computational Method**

**EXPERIMENT # 4:**

**Lagrange & Newton's Divided Difference Interpolation**

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| **INSTRUCTOR: ENGR. YASIR ISMAIL** | **SIGN:** |

**Lagrange Interpolating Polynomials**

**Matlab Code:**

clear all;

x = [8.1 8.3 8.6 8.7];

y = [16.944 17.5656 18.505 18.821];

sum = 0;

a = 8.4;

for i = 1:length(x)

u = 1;

l = 1;

for j = 1:length(x)

if j ~= i

u = u \* (a - x(j));

l = l \* (x(i) - x(j));

end

end

sum= sum + u / l \* y(i);

end

disp(sum);

**Newton's Divided Difference Interpolation**

**Matlab Output:**

% POINTS X=x0,x1,x2,x3 AND Y=y0,y1,y2,y3

clear all

clc

syms x

x=8.4;

X=[8.1 8.3 8.6 8.7];

Y=[16.944 17.5656 18.505 18.821];

U=length(X);

%Please review your Notes for formula

for i=1:U

for j=1:U

if i<j

f=(Y(j)-Y(i))/(X(j)-X(i));

ndd=Y(i)+f\*(x-X(i));

end

end

end

disp(ndd)